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background are porphyritic chlorite crystals with all the characteristics of chloritoid. Graphite, ankerite, zircon, tourmaline and rutile are the prominent accessory constituents. The rutile occurs as needles penetrating all the other minerals.—In an article on the bituminous rocks of Nullaberg, in Sweden, Törnebohm¹ gives the results of his examination of the bituminous matter existing in the archæan schists of that region. The locality has been known for some time, and is quite noted as having afforded data for arguments in favor of the existence of life in the globe during archæan time. The rock in which the organic matter occurs is a schist composed of microcline, chlorite, a little garnet and other accessory components. It is interstratified with gneiss, and is about fifteen metres in thickness. A part of the organic matter is in little lumps and irregularly shaped pieces, which are thought by the author to be original. It is sometimes entirely surrounded by microcline. Other bituminous substances fill cracks and cavities, which were probably produced in the rock by dynamic forces. This is younger in age than the rock itself, and was probably produced by the saturation of shattered rock by liquid hydrocarbons, which afterwards dried out, leaving a deposit of asphaltum.

MISCELLANEOUS.—In connection with the article of Törnebohm, referred to above, it may be of interest to call attention to a recent article by Engler,² on the origin of petroleum. The experimental work of this chemist substantially re-enforces the theory which supposes petroleum to be the result of the distillation of the remains of marine animals at a low temperature and under pressure. Engler has obtained a series of oils, very similar in composition to the most prominent hydrocarbons of petroleum, by the destructive distillation of menhaden under a pressure of ten atmospheres, and at a temperature of 320°–400°.

ZOOLOGY.

ZOOLOGICAL NEWS.—PORIFERA.—Vol. XXV. of the Challenger Reports is entirely devoted to the Tetractinellidæ, which are illustrated by forty-four plates. Professor Sollas classifies the Porifera as follows: Class (1) Megamastictora, containing the single sub-class Calcareia; and Class (2) Micromastictora, including

¹ Neues Jahrb. f. Min., etc., 1888, ii., p. 1.

² Ber. d. d. Chem. Gesell., 1888, p. 1816.

the three sub-classes Myxospongiæ, Hexactinellidæ, and Demospongiæ. The Demospongiæ he sub-divides into Tetractinellida and Monaxonida, the former comprising such Demospongiæ as have some or all of the scleres in the form of tetraxons, triænes, or desmas.

CŒLEENTERATA.—The third of the reports composing Vol. XXIII. of the Challenger series is by Professor G. J. Allman, and forms the second part of his memoir of the Hydroida. Only three genera of Gymnoblasic hydroids: *Stylactis*, *Eudendrium*, and *Monocaulos* are represented in the Challenger collections. *M. imperator* is a most remarkable hydroid, having a stem seven feet long though but half an inch thick, and a stretch from tip to tip of tentacles of nine inches, so that all other hydroids sink into insignificance as regards size when compared with it. It was obtained at the depth of four miles beneath the surface. The Calyptoblastea were well represented in the collection. *Idia*, *Lamoureux*, proved on thorough examination to be constructed on a quite unique type, and a new genus, *Perisiphonia*, represented by two species, was discovered. In this genus the axial tube which bears the hydrothecæ is surrounded by numerous tubes set with tubular sarcothecæ, and the hydrothecæ projects through interstices in these axial tubes. The curious genus *Synthecium* is enriched with two new species, *Thecocladium* with one.

Professor Allman's system of classification does not allow those Hydromedusæ which have not yet been traced back to hydriform stocks, but which, from their resemblance to those that have been so traced, may be presumed to have been budded off from fixed trophosomes, to compose a separate group, but leaves them to find their right place in the future. His sub-orders are, therefore, (1) *Gymnoblastera*, in which the hydranths and gonophores are always naked, and in which the latter may be hedrioblasts or planoblasts, and the planoblasts are almost always *Anthomedusæ*, *i.e.*, have the generative elements developed in the walls of the manubrium. (2) *Calyptoblastea*, which have hydrothecæ and gonangia, and, when they produce planoblasts, have them in the form of *Leptomedusæ*, *i.e.*, with the generative elements developed along the line of the radial canals. (3) *Eleuthero blastea*, including the *Hydra*, with hydranth buds which become free. (4) *Hydrocorallia*, with a calcareous corallum permeated by cœnosarcæ tubes from which the hydranths are developed. (5) *Monopsea*, including forms that are known to be developed directly from the egg. (6) *Rhabdophora* or *Graptolites*.

VERMES.—Vol. XXIII. of the Challenger series has a short report upon the Entozoa of the collection, by Dr. O. von Linstow.

Only sixteen species are described, ten of which are Nematodes and six Cestodes. The species obtained were chiefly from the alimentary tract of birds, and include four new forms of *Ascaris*, three of *Filaria*, one of *Prothelmius*, four of *Tænia*, and two of *Tetrabothrium*. The appendix mentions a large larval *Echinorhynchus* found in the abdomen of a *Euphausia*, two *Distoma*, and a *Gordius* found in a crab, so that the other groups of Helminths are not entirely absent from the collection.

MOLLUSCA.—The report upon the Heteropoda of the Challenger collection, by E. A. Smith, although short, contains a most complete synonymic list of all known forms of the group. It is the fifth report in Vol. XXIII.

The first two memoirs of Vol. XXIII. of the Challenger Reports are by Dr. Paul Pelseneer, and treat of the Pteropoda Thecosomata, the Gymnosomata having been previously dealt with in Vol. XIX. The Thecosomata have a less highly organized alimentary canal than the Gymnosomata, and content themselves with humbler prey, feeding chiefly on Radiolaria, Foraminifera, Infusoria, and even on some of the lower Algæ. Specimens of the group were taken alive at seventy different stations, but no undescribed species were found. All the generic titles that have been given may be reduced to eight, viz.: *Limacina*, *Peraclis*, *Clio*, *Cuvierina*, *Cavolinia*, *Cymbulia*, *Cymbuliopsis*, gen. nov. and *Gleba*. The third part of the report treats of the anatomy of the Pteropoda generally. He considers the group, not as a class, but as a recent and specialized variation from the Gastropod type. He places them among the Pectinibranchiate Oplstobranchs, and traces the Thecosomata to the Bulloidea, and the Gymnosomata to the Aplysioidea.

CRUSTACEA.—Vol. XXIV. of the Challenger Reports is occupied with the report of C. Spence Bate, F.R.S., on the Crustacea Macrura. Though styled one volume, it is in fact two goodly tomes, the one containing 1030 pages of text, the other 157 lithographic plates. Not only are generic and specific diagnoses given with minuteness, but all that is known of the developmental stages (in which direction there is still much work to be done) is reproduced. Bate follows Dana in placing the Penæidea in a separate division, which he names Dendrobranchiata, and he considers the Schizopoda or Stomapoda as forming an aberrant branch of the Dendrobranchiata, more nearly allied to the degraded forms of the Penæidea than to those of any other group. He asserts that, "with the exception of the pereopoda, the several genera do not possess a single character that is not held in common with some genus of the Macrura," divides the Macrura into the two principal

divisions of Trichobranchiata and Phyllobranchiata, with the Dendrobranchiata (Penæidea and Sergestidæ), intercalated. Each of these divisions is divided into two sections, the Normalia and the Aberrantia. The family Galethæidæ belongs among the Trichobranchiata Aberrantia, while the rest of the old group Anomoura form the Aberrantia of the Phyllobranchiate section. These groups will form the subject of a report by Professor John R. Henderson.

Recent works upon lacustrine faunas have shown that copepods, and especially those of the genus *Diaptomus*, are both more numerous in species and more widely distributed than is generally supposed. Most of the ordinary types have been confounded under the name of *Diaptomus castor*, so that until now it has not been possible to speak with any approach to certainty of the geographical distribution of any species. M.M. de Guerne and Richard have now, thanks to the numerous documents they have studied on the subject, given a map of the distribution of *Diaptomus*, and proved that it may be regarded as a cosmopolitan genus.

ENTOMOLOGY.¹

ENTOMOLOGY FOR BEGINNERS.—The most important Entomological event of the past month is the appearance of an elementary text-book by Dr. Packard.² The following review of this work has been prepared by a prominent Entomologist at our request.—*J. H. C.*

Dr. Packard's *Entomology for Beginners* fills a niche which has long been vacant, and supplies a need which has been so pressing, particularly of late years, that it will be and should be warmly welcomed; and wherever imperfections may be noticed by the critical reader, these should not make him forget that Dr. Packard has, in writing this book, given us really the first treatise of its class in the English language. We find after careful reading that an astonishing amount of information has been crowded into its three hundred odd pages, and that the plan of the work is on the whole satisfactory. The author has in his preface outlined his ideas as to the probable usefulness of the work with sufficient

¹ This Department is edited by Prof. J. H. Comstock, Cornell University, Ithaca, N. Y., to whom communications, books for notice, etc., should be sent.

² *Entomology for Beginners*, by Dr. A. S. Packard, M.D., Ph.D., New York. Henry Holt & Co. 1888.